known whether the growth rings where found are annual or seasonal, but from the data now in hand it appears that the soft wood trees become mature in the Philippine tropical forest in one-half to two-thirds the time that is taken by similar trees in the climate of the northern United States.—H. C. COWLES.

A non-corticated Chara.—Material of such a form was studied by Miss SLUITER,[20] along with *C. contraria* and *C. dissoluta*. The non-corticated form appeared in a laboratory culture of *Nitella* which had died down, and was also found later during an excursion to the upper Zürich Sea in the region of Busskirch. The two problems the author set herself for solution are: (1) What are the relations between *Chara dissoluta* and *C. contraria?* (2) Does the constantly non-corticated form of Busskirch belong in the *C. contraria* group? Is it to be joined with *C. dissoluta*, or are the relations to other non-corticated forms closer?

The main work is divided into three parts: the development of the shoot and its side-organs in *C. contraria;* that in *C. dissoluta;* and that in the *Chara* from Busskirch. Each part is subdivided into the internal and external features. In the results and conclusions the author states that there is great agreement between *C. contraria* and *C. dissoluta* f. *helvetica*. She believes there is not sufficient evidence to consider the latter as one of the many forms of the former, and would not, from her investigation, place it next to *C. contraria*. As to the non-corticated *Chara* of Busskirch, the non-corticated forms of *C. coronata* and *C. stelligera*, which have appeared before in Europe, show no relation to it. Other non-corticated species are no more similar. The author decides that the form must fall in with *C. dissoluta* f. *helvetica* and *C. contraria*. She believes that it must be designated as *C. dissoluta* f. *helvetica*, and that the entirely non-corticated form can appear independently from a one-layered corticated form.—NORMA E. PFEIFFER.

Synapsis.—In a short but important paper, LAWSON[21] presents an interpretation of synapsis entirely at variance with current views, and supports his interpretation with such convincing evidence that some of our current notions must be revised. The name synapsis implies that it is a contraction stage, and as such it has been regarded. LAWSON shows conclusively that there is no contraction of the chromatin mass during the phase known as synapsis. For illustration he has taken the pollen mother cells of *Smilacina*, because it is easy to get complete series of stages in a single section, but he has confirmed the results secured in this genus by a study of algae, fungi, bryophytes, pteridophytes, gymnosperms, and other angiosperms.

During the growth of the spore mother cell, the great accumulation of nuclear sap causes the nuclear cavity to expand until it reaches two or three

[20] SLUITER, CATHª. P., Beiträge zur Kenntnis von *Chara contraria* A. Braun und *Chara dissoluta* A. Braun. Bot. Zeit. **68**:125–168. *pls. 4–8. figs. 21.* 1910.

[21] LAWSON, A. ANSTRUTHER, The phase of the nucleus known as synapsis. Trans. Roy. Soc. Edinburgh **47**:591–604. *pls. 1, 2.* 1911.

times its original size, the chromatin remaining in one place, while the rest of the nuclear cavity is occupied only by the sap. A complete series of measurements shows that the chromatin area has not diminished. Although there is no contraction, important changes take place in the chromatin during synapsis. There is some evidence that the reticulum of the resting nucleus is composed of a number of threads, and that this number corresponds to the diploid number of chromosomes. Further, the threads are double and there is no evidence of any blending or fusion, the actual reduction occurring much later than the period known as synapsis. A paper dealing with the details of reduction is to follow.—CHARLES J. CHAMBERLAIN.

Turgescence and respiration.—MAIGE and NICOLAS[22] have performed some very interesting experiments upon the effect of turgescence upon respiration. The materials used were various buds, leaves, and embryos. The gas determinations were made by the Bonnier-Mangin method. The work is reported under three heads: effect of increase of turgescence, effect of decrease of turgescence, and effect of a decrease followed by an increase. A rise in turgescence is always followed by increased production of CO_2, intake of O_2, and an increase in the ratio CO_2/O_2. A fall in turgescence produces similar but less marked effects in material taken directly from the plant or soaked for a period in 5 per cent sucrose. In material previously soaked in 10 or 20 per cent glucose, this treatment always gives a decrease in CO_2, O_2, and frequently in the CO_2/O_2. Each change, in the decrease followed by the increase, generally gave an increase in CO_2, O_2, and CO_2/O_2. These facts are new and most interesting, but the interpretations will not find universal acceptance. The authors believe that increased turgescence increases respiration by increasing growth; and decreased turgescence by concentrating the oxidizable solutes of the cell. The first stimulative effect they consider the greater. The authors postulate an optimum concentration for the oxidizable solutes of the cell, and attribute the reversal of behavior after treatment with the strong glucose solutions to this optimum being passed.—WILLIAM CROCKER.

New mesozoic plants.—JEFFREY[23] has described a new araucarian genus (*Woodworthia arizonica*) from a triassic forest of Arizona. The wood is of the *Araucarioxylon* type, but the short shoots are abietineous, and persisted in the wood of the trunk throughout the life of the tree. It is suggested that short shoots characterized the older coniferous stock, and that this would fit into the current explanation of the coniferous ovuliferous scale as a modified short shoot. The leaf traces did not persist in the secondary wood, as they do among the living araucarians, but JEFFREY does not regard persistent leaf traces as an ancestral character of the coniferous stock, as SEWARD and LIGNIER have claimed, but as a more recently acquired character. The testimony of *Wood-*

[22] MAIGE, A., et NICOLAS, G., Recherches sur l'influence des variations de la turgescence sur la respiration de la cellule. Rev. Gén. Botanique **22**:409–422. 1910.

[23] JEFFREY, E. C., A new araucarian genus from the Triassic. Proc. Boston Soc. Nat. Hist. **34**:325–332. *pls. 31, 32.* 1910.